

Nuclear and Atomic Physics

DESIGN AND CONSTRUCTION OF THE WKU ION BEAM MATERIALS

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The Applied Physics Institute at Western Kentucky University has recently received a 2.5 MV Van de Graaff from the Army Research Laboratory in Aberdeen, MD. This accelerator is to become the focal point of an “Ion Beam Materials Analysis Laboratory.” The accelerator’s ion source is designed for any gas and our current plans are to utilize low Z beams such as H, D, and He-4. We plan to have to four beam stations. One of the future end stations will contain equipment to perform Particle Induced X-ray Emission (PIXE) analysis. In this analysis, the ion beam strikes a sample and the characteristic x-rays from that sample are identified and quantified. Another end station will measure Rutherford backscattering (RBS). RBS allows the analysis of surface contaminants and defects. A third end station will be dedicated to ion implantation which can create new materials or modifying existing materials. As part of this presentation, we will present the designs for the laboratory along with the engineering and radiological safety constraints.